What is claimed is:

1. A non-destructive method of measuring a non-scattering coating on a metallic substrate, the method comprising:

non-destructively determining at a first wavelength a first total amount of infrared energy reflected from a metallic substrate that is coated with a non-scattering coating;

non-destructively determining at a second wavelength a second total amount of infrared energy reflected from the coated, metallic substrate;

determining a difference between the first and second total amounts of infrared energy; and

determining that at least a predetermined amount of the coating is coated on the metallic substrate when the difference between the first and second total amounts of infrared energy is at least a predetermined difference.

2. The method of Claim 1, wherein the substrate is non-specular.

3. The method of Claim 1, wherein the substrate is specular.

4. The method of Claim 1, further comprising correlating the difference between the first and second total amounts of infrared energy to an amount of the coating.

5. The method of Claim 1, wherein the second wavelength is longer than the first wavelength and the second total amount of reflected infrared energy is less than the first total amount of reflected infrared energy.

6. The method of Claim 5, wherein the first wavelength is in a first range from around 7 μm to around 8 μm and the second wavelength is in a second range from around 10.5 μm to around 12 μm.

7. The method of Claim 1, wherein the coating includes phosphoric acid anodize.

8. The method of Claim 1, wherein the metallic substrate includes aluminum.

9. A method of non-destructively measuring a non-scattering coating on a metallic substrate, the method comprising:

transmitting an infrared beam into a non-scattering coating on a metallic substrate;

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collecting total reflectance of infrared energy from the coated metallic substrate;

integrating the collected total reflectance;

detecting a first amount of infrared energy of the collected total reflectance at a first wavelength and a second amount of infrared energy of the collected total reflectance at a second wavelength;

determining a difference between the first and second amounts of infrared energy; and

determining that at least a predetermined amount of the coating is coated on the substrate when the difference between the first and second amounts of infrared energy is at least a predetermined difference.

10. The method of Claim 9, wherein the substrate is non-specular.

11. The method of Claim 9, wherein the substrate is specular.

12. The method of Claim 9, further comprising correlating the difference between the first and second amounts of infrared energy to an amount of the coating.

13. The method of Claim 9, wherein the second wavelength is longer than the first wavelength and the second amount of infrared energy is less than the first amount of infrared energy.

14. The method of Claim 13, wherein the first wavelength is in a first range from around 7 μm to around 8 μm and the second wavelength is in a second range from around 10.5 μm to around 12 μm.

15. The method of Claim 9, wherein the coating includes phosphoric acid anodize.

16. The method of Claim 9, wherein the substrate includes aluminum.

17. The method of Claim 9, further comprising filtering at the first wavelength and at the second wavelength.

18. The method of Claim 17, wherein the filtering is performed on the transmitted infrared beam.

19. The method of Claim 17, wherein the filtering is performed on the integrated collected total reflectance.

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20. The method of Claim 9, wherein the total reflectance includes total hemispherical reflectance.

21. A method of non-destructively measuring a non-scattering coating on a metallic substrate, the method comprising:

transmitting an infrared beam into a non-scattering coating on a metallic substrate;

collecting total hemispherical reflectance of infrared energy from the coated metallic substrate;

integrating the collected total hemispherical reflectance;

filtering at a first wavelength and a second wavelength that is longer than the first wavelength;

detecting a first amount of infrared energy of the collected total hemispherical reflectance at the first wavelength and a second amount of infrared energy of the collected total hemispherical reflectance at the second wavelength;

determining a difference between the first and second amounts of infrared energy; and

determining that at least a predetermined amount of the coating is coated on the substrate when the difference between the first and second amounts of infrared energy is at least a predetermined difference.

22. The method of Claim 21, wherein the substrate is non-specular.

23. The method of Claim 21, wherein the substrate is specular.

24. The method of Claim 21, further comprising correlating the difference between the first and second amounts of infrared energy to an amount of the coating.

25. The method of Claim 21, wherein the second amount of infrared energy is less than the first amount of infrared energy.

26. The method of Claim 21, wherein the first wavelength is in a first range from around 7 μm to around 8 μm and the second wavelength is in a second range from around 10.5 μm to around 12 μm.

27. The method of Claim 21, wherein the coating includes phosphoric acid anodize.

28. The method of Claim 21, wherein the metallic substrate includes aluminum.

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29. The method of Claim 21, wherein the filtering is performed on the transmitted infrared beam.

30. The method of Claim 21, wherein the filtering is performed on the integrated collected total reflectance.

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